

# UK Patent Application (19) GB (11) 2 283 429 (13) A

(43) Date of A Publication 10.05.1995

(21) Application No 9415157.8

(22) Date of Filing 27.07.1994

(30) Priority Data

(31) 9322786

(32) 04.11.1993

(33) GB

(51) INT CL<sup>6</sup>  
A61M 5/32

(52) UK CL (Edition N )  
A5R RGG

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(58) Field of Search  
UK CL (Edition N ) A5R RGG , B4B  
INT CL<sup>6</sup> A61M 5/32

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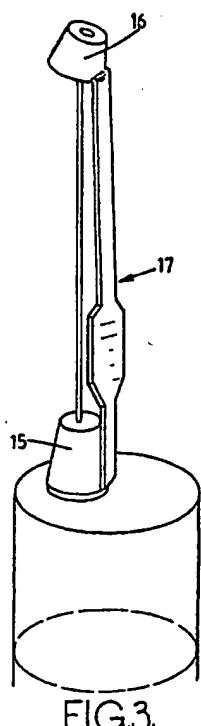
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## (54) A protector for a syringe needle or scalpel

(57) The protector 16 is movable along a needle or scalped between an inoperative position in which it exposes the pointed end or sharp edge portion of the implement and an operative position in which it covers the pointed end or sharp edge portion of the implement. The protector also comprises a holder 15 for fitting to the implement and an arm 17, connecting the protector to the holder which prevents separation of the protector from the implement. The protective element flips into a tilted position to prevent unintentional movement of the protector to expose the pointed end or sharp edge.

In a further embodiment the protector has two flexible arms connecting it to the holder, and is of generally spherical shape with a through passage.



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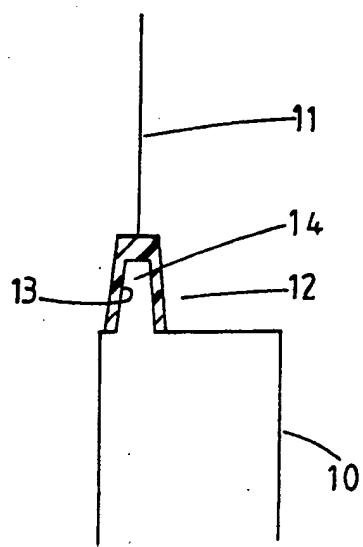


FIG. 1

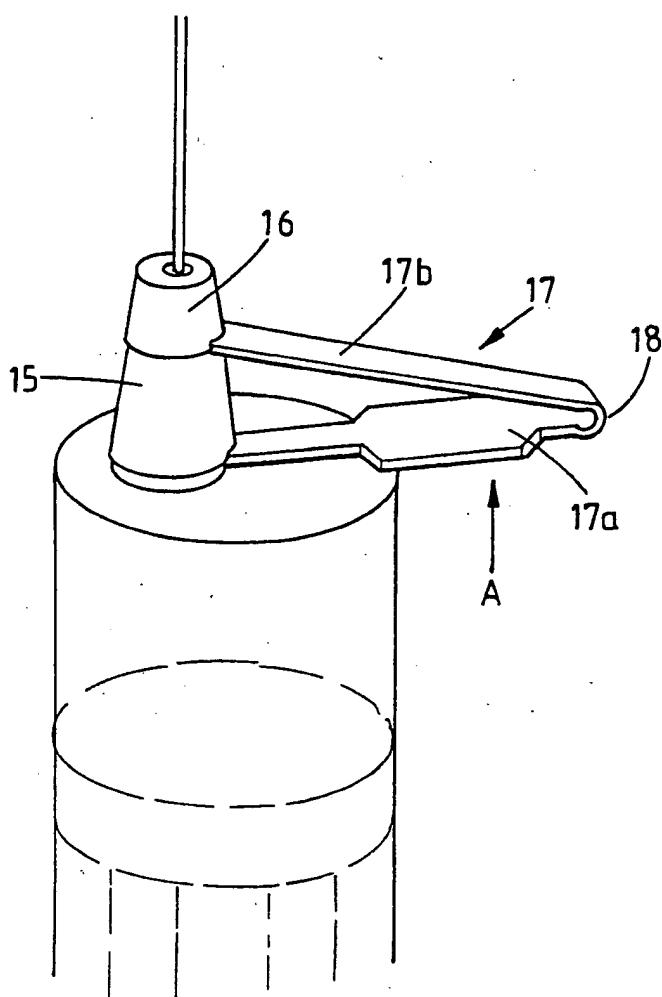


FIG. 2

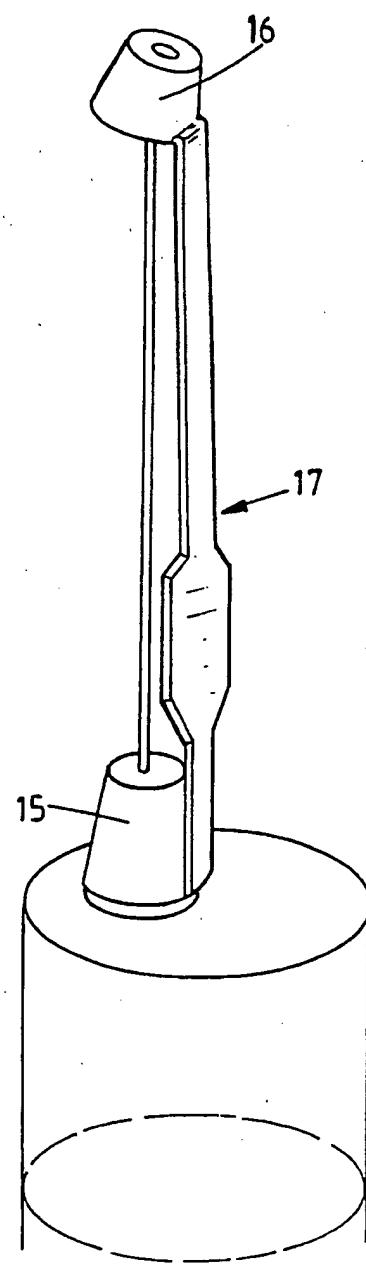
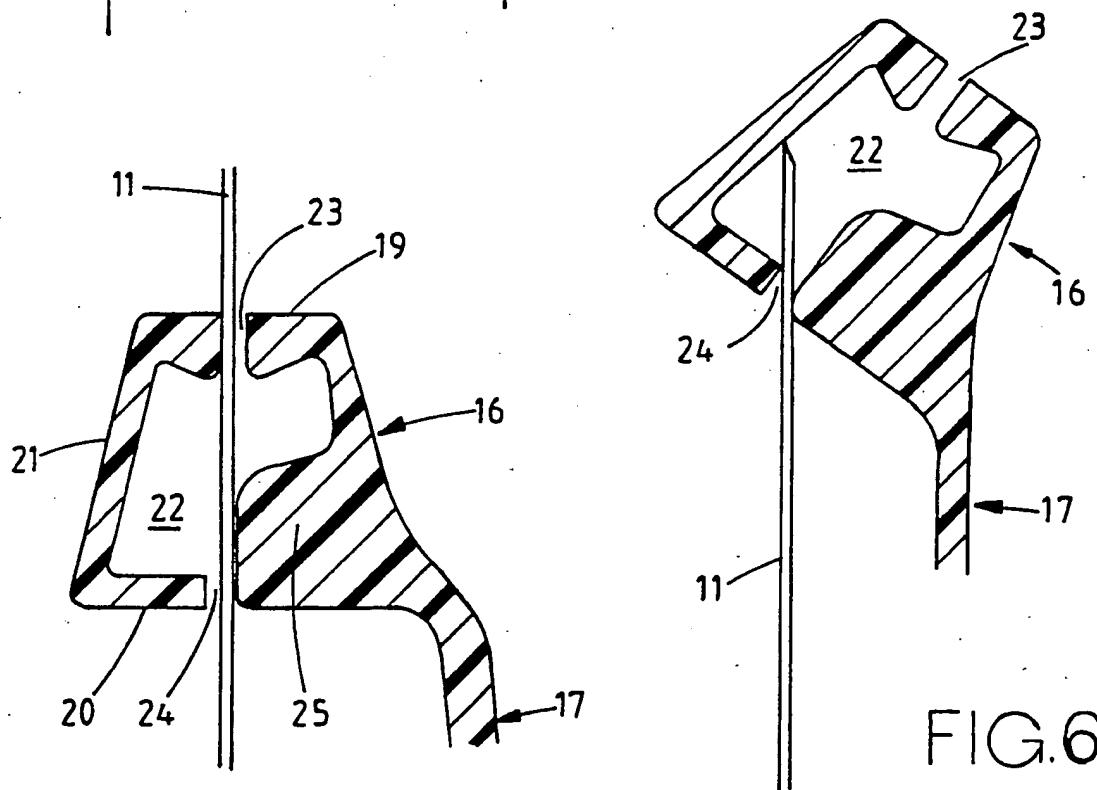
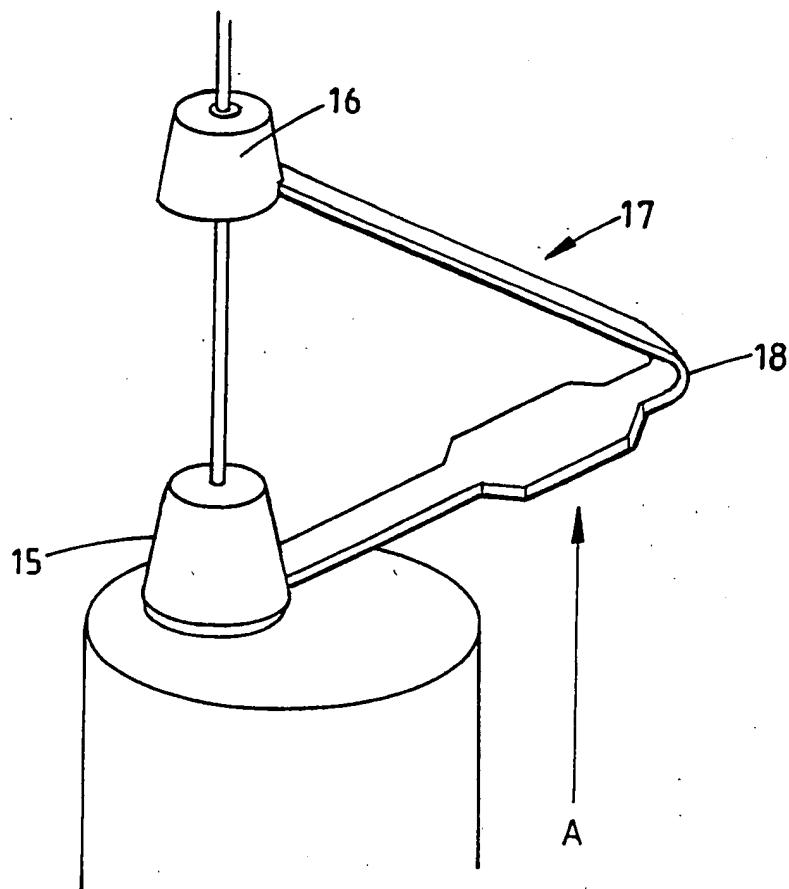


FIG. 3



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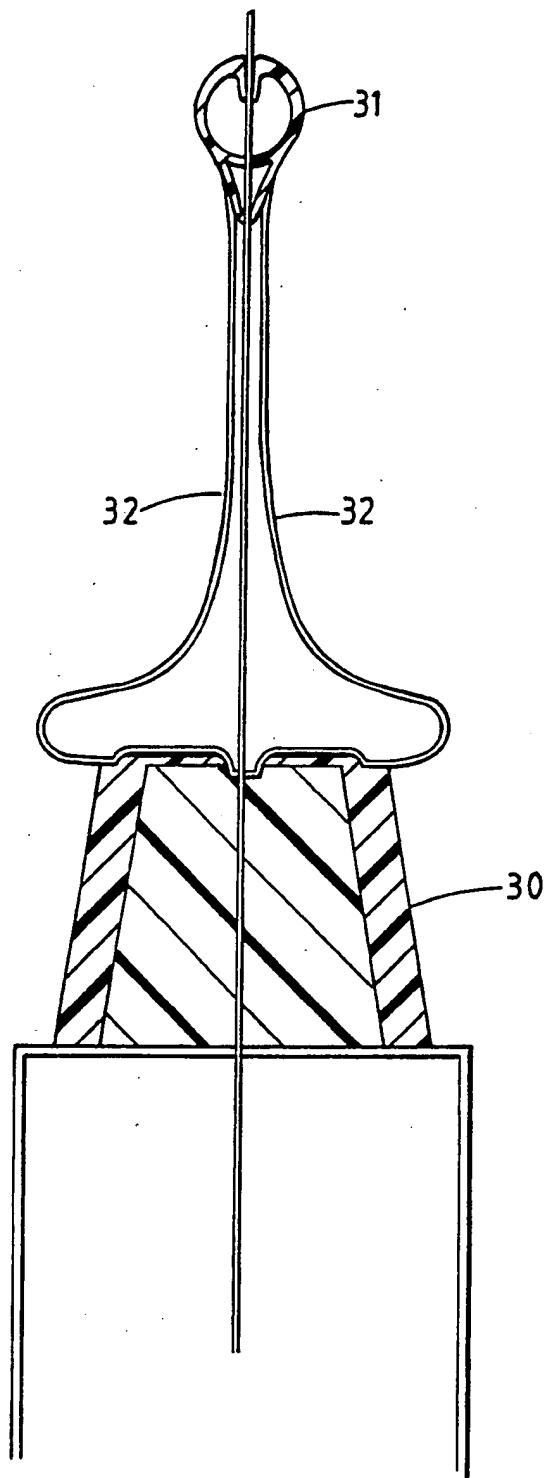


FIG.7.

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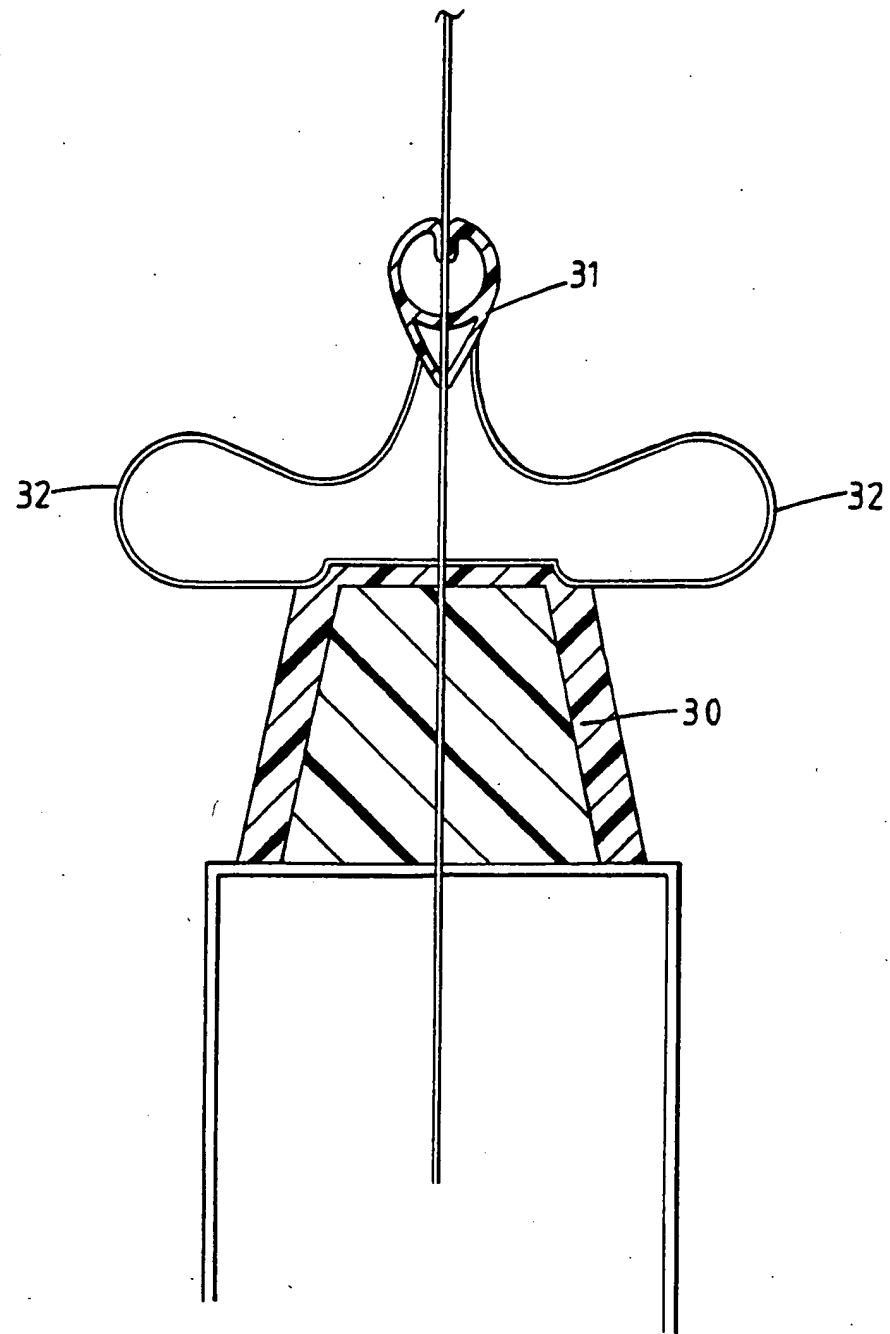


FIG.8.

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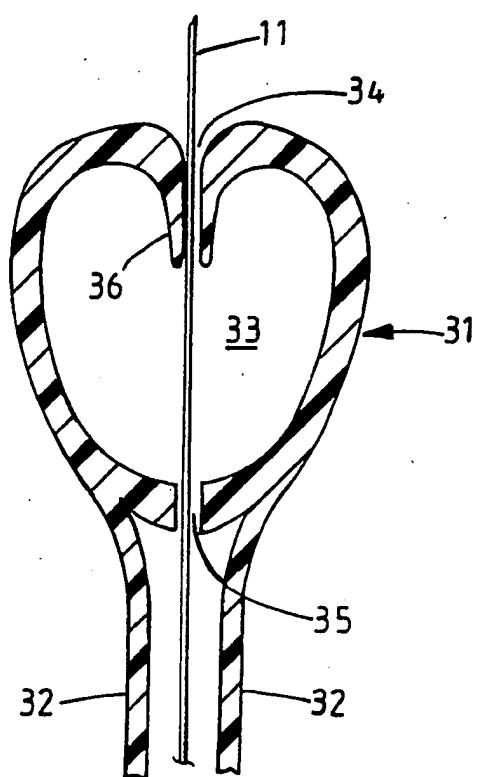


FIG.9.

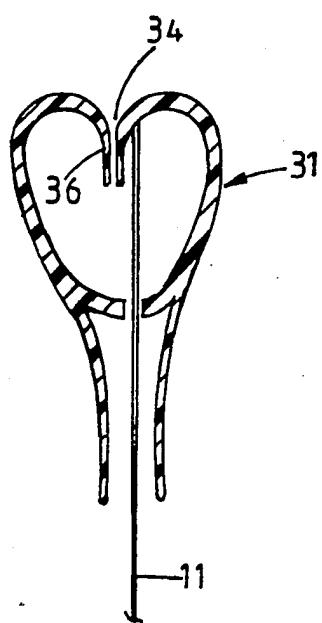


FIG.10.

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A PROTECTOR FOR AN ELONGATE IMPLEMENT

This invention relates to a protector for an elongate implement, such as a hypodermic syringe or 5 scalpel.

Hypodermic syringes have many uses ranging from the delivery of chemical substances and medicamentation, to the removal of body fluid, typically although not 10 exclusively blood products, and laboratory use. Such use is characterised by the needle point being exposed for the procedure to be effected. Following this procedure, it is desirable for the needle point to be resheathed/covered to prevent it coming into contact with another person by 15 design or accident, and/or during the disposal procedure. There is a need for the safe resheathing/covering of the needle point.

According to the present invention there is 20 provided a protector for an elongate implement having a pointed end or sharp edge portion, comprising a protective element movable in use along the implement between an inoperative position in which it exposes the pointed end or sharp edge portion of the implement and an operative 25 position in which it covers the pointed end or sharp edge portion of the implement, a holder for fitting to the implement, and means connecting the protective element to the holder to in use allow the protective element to move

along the implement between said inoperative and operative positions but to prevent separation of the protective element from the implement.

5            Preferably, the protective element is easily movable from its inoperative to its operative position but is not so easily movable from its operative to its inoperative position.

10           The implement may have a pointed end, i.e. it may be a needle or hypodermic syringe, which is disposed within the protective element when in use the protective element is in its operative position and, in this case, the protective element is preferably so designed that it cannot  
15        easily be placed back over the implement so as to expose the pointed end of the implement.

20           Preferably, the protective element has an internal cavity in which the pointed end of the implement is disposed when in use the protective element is in its operative position and an aperture through which the pointed end of the implement passes in order to move into said internal cavity as the protective element is moved from its inoperative to its operative position.

25

Advantageously, the connecting means is a single elongate element which may have an integral hinge intermediate its two ends. In this case, the single

elongate element is preferably connected to the protective element such that when in use the protective element is moved to its operative position the angle between the protective element and the elongate element changes and  
5 stores energy so that when the pointed end of the implement passes into the cavity the protective element is tilted as some of the stored energy is released and the aperture is moved out of alignment with the pointed end of the implement.

10

Additionally or alternatively, the protective element may be internally shaped so as to encourage the protective element to tilt as in use the pointed end of the implement passes into the cavity so that the aperture is  
15 moved out of alignment with the pointed end of the implement.

As an alternative to a single elongate element, the connecting means may comprise two flexible elongate elements, each connected between the holder and protective element. In this case, the aperture may be in part defined by a sleeve portion projecting into the cavity so that when the pointed end of the implement is disposed in the cavity it is difficult to reinsert the pointed end into the  
25 aperture.

Conveniently, the protector is formed as an integral plastics moulding, typically in polypropylene.

The invention also provides a hypodermic syringe equipped with a protector as described above.

The invention will now be more particularly  
5 described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a conventional syringe and needle fitting;

10

Figure 2 shows one embodiment of a protector according to the invention mounted on a hypodermic syringe in an inoperative position;

15

Figure 3 shows the protector of Figure 2 in an operative position;

20

Figure 4 shows the protector of Figures 2 and 3 in a position intermediate its inoperative and operative positions;

Figure 5 is a cross-sectional view of the protective element in the position shown in Figure 4;

25

Figure 6 is a cross-sectional view of the protective element in the position shown in Figure 3;

Figure 7 shows a further embodiment of a

protector according to the invention mounted on a syringe,  
in an inoperative position;

Figure 8 shows the protector of Figure 7 in a  
5 position adopted during insertion of the needle of the  
syringe into tissue;

Figure 9 is a cross-sectional view of the  
protective element of the protector shown in Figure 7, and

10

Figure 10 is a cross-sectional view showing the  
protective element of the protector in an operative  
position.

15

Figure 1 of the drawings shows a conventional  
syringe. The syringe comprises a syringe body 10, a needle  
11 and a needle holder 12. The holder 12 is of frusto-  
conical shape and has a frusto-conical cavity 13 for  
receiving a complementary projection 14 on the syringe body  
20 10. The holder may be internally threaded for engagement  
with an external thread on the projection 14 or may be  
otherwise secured to the projection 14, such as by adhesive  
or as a snap or push fit. The needle 11 is secured to the  
holder 12, such as by moulding it to the needle 11.

25

Referring now to Figures 2 to 6 of the  
accompanying drawings, there is shown therein a protector  
comprising holder 15 (similar to holder 12), a protective

cap 16 and an arm 17 connecting the cap 16 to the holder 15. The arm 17 is formed in two parts 17a and 17b with a hinged joint 18 therebetween.

5           The cap 16 is of frusto-conical external shape and comprises a top wall 19, a bottom wall 20 of larger diameter than the top wall and a skirt 21. The cap 16 has an internal cavity 22 and the top and bottom walls 19 and 20, respectively, have aligned apertures 23 and 24, 10 respectively, which communicate with the internal cavity 22.

The protector is formed as a plastics moulding, typically in polypropylene, and is moulded in its 15 inoperative position (see Figure 2) so that as the arm 17 is extended the angle between the protective cap 16 and the arm 17 changes and stores energy. This has the advantage that when the pointed end of the needle 11 enters the cavity 22 (as described hereinafter) the cap 16 flips into 20 a tilted position (see Figure 6) as some of the stored energy is released.

In the example shown, the internal cavity 22 is 25 of asymmetrical shape, the asymmetry of the cavity being caused by a bulbous protrusion 25 extending into the cavity between the bottom wall 20 and the skirt 21 on that side of the aperture 24 adjacent to the arm 17. The purpose of this protrusion 25 is to further encourage the cap 16 to

flip into the tilted position shown in Figure 6 when the point of the needle 11 enters the cavity 22. It also has the advantage that it provides a nice feel to the flipping action leaving the user with no doubt that the cap 22 has  
5 moved to a safe position. However, it is difficult to mould an internal cavity of this shape and in practice the cap 22 would have to be moulded in two parts which are then secured together such as by ultrasonic welding. This, of course, adds to the cost of the protector. The protrusion  
10 25 may, therefore, be omitted. This would create more space to accommodate any blood on the needle 11.

Figure 2 shows the protector in an inoperative position with the cap 16 mounted about the needle 11 and  
15 bearing against the holder 15. When the syringe has been used, the protective cap 16 can be placed over the needle point by extending the arm 17. This is achieved by applying pressure to the lower arm portion 17a in the direction indicated by arrow A in Figure 2. The two arm portions 17a and 17b will unfold as shown in Figure 4 and the cap 16 will move along the longitudinal extent of the needle until the needle point passes into the cavity 22 of the cap 16 as shown in Figures 3 and 6. When the point of the needle 11 leaves the aperture 23 and passes into the  
20 25 cavity 22, the cap 16 flips into the tilted position shown in Figure 6.

Once the cap has flipped into this tilted

position, it is virtually impossible for the needle tip to be reinserted into the aperture 23 unintentionally and the cap will prevent the needle tip from accidental contact with humans.

5

Ideally, the aperture 23 is large enough to allow any blood on the needle 11 to be carried into the cavity 22 but small enough to prevent blood seeping therefrom.

10

Referring now to Figures 7 to 10, the protector shown therein comprises a holder 30 (similar to holder 15), a needle point cover 31 and two flexible arms 32 connected between the holder 30 and the cover 31.

15

The cover 31 is typically of generally spherical shape and has an internal cavity 33. The cover 31 also has upper and lower apertures 34 and 35, respectively. The upper aperture 34 is in part bounded by a sleeve-like projection 36 extending into the cavity 33 so that when the 20 point of the needle 11 leaves the aperture 34 and enters the cavity 33 (as shown in Figure 9), it is virtually impossible for the point of the needle to re-enter the aperture 34 unintentionally.

25

The arms 32 hold the cover 31 close to the point of the needle 11 prior to use of the syringe (as shown in Figure 7). When the needle 11 is inserted into tissue, the cover 31 is displaced towards the holder 15 (as shown in

Figure 8). The arms 32 are thus deformed and store energy. When the syringe is removed from the tissue the stored energy in the arms 32 is released and the cover 31 returns to its original position. It is then moved further along 5 the needle until the point of the needle enters the cavity 33 by manually compressing the two arms 32. Alternatively, the holder 30 could be provided with a slider or threaded device for compressing the arms 32.

Typically, the protectors described are moulded in polypropylene.

The embodiments described above are given by way of example only and various modifications will be apparent 15 to persons skilled in the art without departing from the scope of the invention as defined in the appended claims.

For example, it is conceivable that the aperture 23 (or 34) could be made self-sealing, although, in 20 practice, this is unlikely as it would add to the cost and prevent any blood on the needle 11 being carried into the cavity 22 (or 33).

Also, the protector may be designed for use with 25 implements other than hypodermic syringes. In particular, the protector could be designed for use with a scalpel. In this case the cover would be elongate, typically in the form of a sheath, so as to protect the entire sharp edge of

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the scalpel when in an operative position.

CLAIMS

1. A protector for an elongate implement having a pointed end or sharp edge portion, comprising a protective element movable along the implement between an inoperative position in which it exposes the pointed end or sharp edge portion of the implement and an operative position in which it covers the pointed end or sharp edge portion of the implement, a holder for fitting to the implement, and means connecting the protective element to the holder to in use allow the protective element to move along the implement between said inoperative and operative positions but to prevent separation of the protective element from the implement.

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2. A protector as claimed in claim 1, wherein the protective element is easily movable from its inoperative to its operative position but is not so easily movable from its operative to its inoperative position.

20

3. A protector as claimed in claim 1 or claim 2, wherein the implement has a pointed end which is disposed within the protective element when in use the protective element is in its operative position and wherein the protective element is so designed that it cannot easily be placed back over the implement so as to expose the pointed end of the implement.

4. A protector as claimed in claim 3, wherein the protective element has an internal cavity in which the pointed end of the implement is disposed when in use the protective element is in its operative position and an aperture through which the pointed end of the implement passes in order to move into said internal cavity as the protective element is moved from its inoperative to its operative position.
- 10 5. A protector as claimed in any one of the preceding claims, wherein the connecting means is a single elongate element.
- 15 6. A protector as claimed in claim 5, wherein the single elongate element has an integral hinge intermediate its ends.
- 20 7. A protector as claimed in claim 5 or claim 6 when dependent on claim 4, wherein the single elongate element is connected to the protective element such that when in use the protective element is moved to its operative position the angle between the protective element and the elongate element changes and stores energy so that when the pointed end of the implement passes into the cavity the protective element is tilted as some of the stored energy 25 is released and the aperture is moved out of alignment with the pointed end of the implement.

8. A protector as claimed in claim 4 or claim 7,  
wherein the protective element is internally shaped so as  
to encourage the protective element to tilt as in use the  
pointed end of the implement passes into the cavity so that  
5 the aperture is moved out of alignment with the pointed end  
of the implement.
9. A protector as claimed in claim 4, wherein the  
aperture is in part defined by a sleeve portion projecting  
10 into the cavity so that when the pointed end of the  
implement is disposed in the cavity it is difficult to re-  
insert the pointed end into the aperture.
10. A protector as claimed in claim 9, wherein the  
15 connecting means comprises two flexible elongate elements  
each connected between the holder and the protective  
element.
11. A protector as claimed in any one of the  
20 preceding claims and formed as an integral plastics  
moulding.
12. A protector substantially as hereinbefore  
described with reference to Figures 2 to 6 or Figures 7 to  
25 10 of the accompanying drawings.

13. A hypodermic syringe equipped with a protector as  
claimed in any one of the preceding claims.

Patents Act 1977  
 Examiner's report to the Comptroller under Section 17  
 (The Search report)

Application number  
 GB 9415157.8

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**Relevant Technical Fields**

- (i) UK Cl (Ed.N) A5R (RGG) B4B  
 (ii) Int Cl (Ed.6) A61M 5/32

Search Examiner  
 MR S J PILLING

Date of completion of Search  
 2 FEBRUARY 1995

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Documents considered relevant following a search in respect of Claims :-  
 1-13

**Categories of documents**

- |    |   |    |   |
|----|---|----|---|
| X: | Document indicating lack of novelty or of inventive step.   | P: | Document published on or after the declared priority date but before the filing date of the present application.        |
| Y: | Document indicating lack of inventive step if combined with one or more other documents of the same category. | E: | Patent document published on or after, but with priority date earlier than, the filing date of the present application. |
| A: | Document indicating technological background and/or state of the art.   | &: | Member of the same patent family; corresponding document.   |

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2252046 A	(STEYN & STEWART) page 1 lines 1 to 17, page 5, line 13 to page 6 line 10 and Figure 2	1-5, 7-9 and 11
X	GB 2202446 A	(CONACHER) page 2 line 9 to 24 and Figure 1	1, 5 and 11
X	GB 1506572	(DEFENCE) page 1 lines 8 to 46, Figures 1 and 2	1 and 4
X	GB 328864	(ANDERSON) page 1 lines 25 to 48, page 1 line 105 to page 2 line 21 and the Figures	1, 3 and 4
X	EP 0344606 A2	(HABLEY) page 2 line 40 to page 3 line 17 and the Figures particularly Figures 1 and 2	1 to 4
X	WO 88/07873 A1	(PEACHTREE) page 2 lines 19 to 27 and the Figures particularly Figures 3B and 3C	1, 5 and 11
X	US 4790828	(DOMBROWSKI) column 2 lines 24 to 36, column 3 lines 57 to 64 and the Figures particularly Figures 2 and 7	1-3 and 11
X	US 4139009	(ALVAREZ) column 2 lines 42 to column 3 line 18 and Figure 2	1-4 and 9-11
X	US 4735618	(HAGEN) column 4 lines 25 to 53 and Figure 3	1-4 and 8-11
X	US 4911706	(LEVITT) column 1 line 56 to column 2 line 22 and Figures 1 and 6	1-9 and 11

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).